

# FISHLIFE

**Part 1** in a series about inshore fish of Hawaii. The 12-part series is a project of the **Hawaii Fisheries Local Action Strategy**.

## ULUA TAGGING REVEALS FISH BEHAVIOR, BREEDING PILGRIMAGES

BY SCOTT RADWAY

AS SUMMER CAME, THE WHITE ULUA AROUND FRENCH FRIGATE SHOALS DID SOMETHING PECULIAR.

Carl Meyer, of the Hawaii Institute of Marine Biology, had tagged dozens of ulua there. His acoustic tags sent out periodic pings that were picked up by his network of underwater receivers, informing him where a fish was any hour of the day.

For most of the year, it was pretty routine stuff. During the day, the white ulua, or Giant trevally, he tagged at Perouse Pinnacle remained inshore and at dusk, they swam offshore, returning in the morning. Every day, it was the same.

Then summer came and his tagged fish started swimming to Rapture Reef, for some that was 20 miles away. A few days later all the fish went home. The same thing happened, the next year. When Meyer and his team analyzed the data, it was clear the mass migrations happened during summer full moons. They had to be spawning.

"Sure enough when we dove the site, we came across large aggregations of ulua consistent with a spawning site," Meyer says.

The state found the results so interesting, the Division of Aquatic Resources is backing Meyer to look for spawning sites in the Main Hawaiian Islands. He has set up 37 receivers along the Big Island's west side and has begun tagging fish. So far, his research has shown that ulua generally remain faithful to their 'home' areas during the winter months; the summer full moons will reveal if spawning migrations occur in the MHI.

Meyer's work is part of a state effort to get a better handle on ulua stocks, which are the most prized sport fish in Hawaii and contribute tens of millions of dollars to the local economy each year. By better understanding the fish, the state can better manage it and maintain the valuable fishery for the long term.

One clear advantage in understanding ulua in Hawaii is the support of fishermen. Concerned about declining ulua numbers, tagging by fishermen was started on the Big Island in 1998 at the request of fishing clubs. This type of tagging requires **CONT. >>**



Photo: Jill Zamzow



NAME **ULUA**



**Ulua are one of the most important predators on Hawaiian coral reefs and the most highly sought after sport fish. The two most sought after jacks are the ulua aukea, or Giant trevally, and the omilu, or Bluefin jack. Here is what we know about those fish.**

FISH:	WHITE ULUA	OMILU
MAXIMUM LENGTH	65 INCHES	30 INCHES
MAXIMUM WEIGHT	191 POUNDS	22 POUNDS
MAXIMUM AGE	20	8
PEAK SPAWNING	MAY TO AUGUST	MAY TO AUGUST
LENGTH AT FIRST MATURITY	23 INCHES	14 INCHES
AGE AT FIRST MATURITY	3.5	2

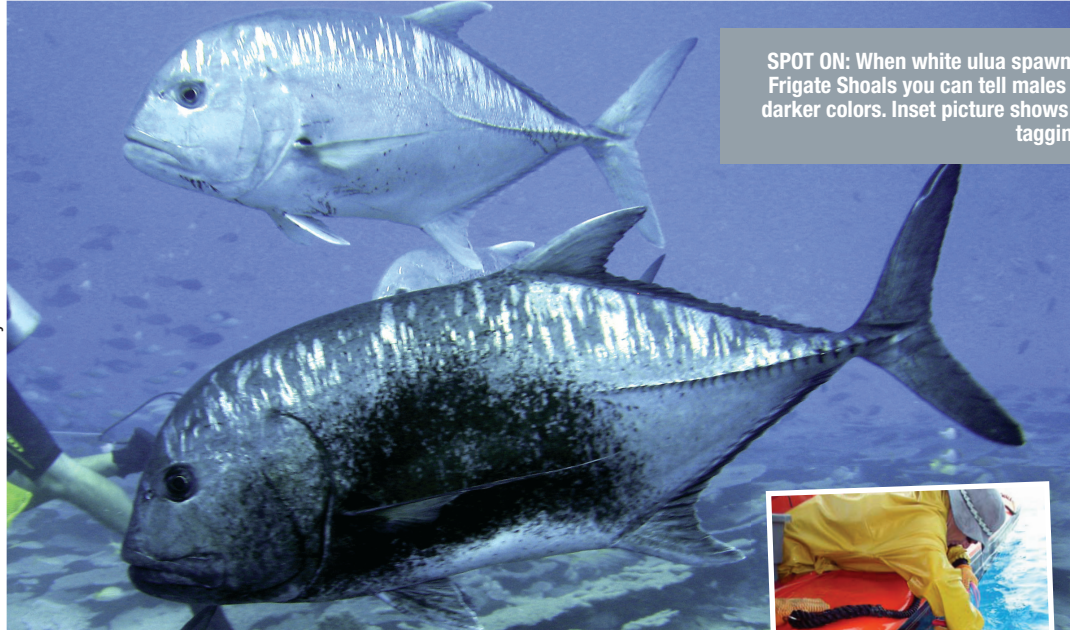
Source: Alan Friedlander and Paul Dalzell

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White ulua off French Frigate Shoals gather each year in one spot to spawn. So do ulua in the Main Hawaiian Islands do the same?

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Photo: Jill Zamzow. Inset Photo: Harvey Walsh



**SPOT ON:** When white ulua spawn in French Frigate Shoals you can tell males from their darker colors. Inset picture shows scientists tagging an ulua.

simply recording the fish details, such as length and location, and then tagging the fish with a serial number so if someone else catches it comparative data can be collected.

Since starting on the Big Island, the program has been expanded statewide and today, 2,500 fishermen in the program have tagged upwards of 30,000 jack fish, including white ulua, but also other jack fish, such as omilu and kahala.

Some information that can be gleaned from the fishermen tagging data is fish movements, growth rates and population estimates. Preliminary findings include such data that shows white papio on the leeward side of Oahu potentially grow at minimal rates, likely because leeward sides lack estuarine areas that serve as nursery grounds for food fish for jack.

"The tagging programs are complimentary," says Meyer. "Together we are providing a very rich picture of the behavior of these fishes."

Fishermen tagging also helps getting management buy-in. "If you make fishermen part of the process, they are more willing to support it," says Clay Tam, one of the DAR tagging program coordinators. "The tagging project started with a lot of skepticism, but now we have 2,500 fishermen who are our eyes and ears."

One of the big challenges in managing fish stocks in Hawaii is that only commercial catches have been tracked over the years. At the same time, there are an estimated 32,000 recreational ulua fishermen in Hawaii and studies comparing fish sizes in the Northwestern Hawaiian Islands and the Main Hawaiian Islands. One recent study found white ulua populations were from 247 times bigger in the NWHI.

One contributing factor to the declines could be the preference to fish the largest jack. Large female jacks produce exponentially more eggs as they get bigger and generally increases the chances of reproduction. One study showed a 14-inch omilu produced 49,700 eggs, while a 27-inch fish produced 4.27 million eggs, or 86 times as many. So taking one 27-inch fish is the equivalent of catching 86, 14-inch fish when it comes to egg production.

Sometimes fishermen also take fish before they start reproducing. A survey in Hanalei Bay found that of 1270 jack, only 9 percent were legal size. Scientists say fishermen can help the stocks grow by letting small fish go, and perhaps some of the largest ones, too. Fishermen can also help by avoiding fishing during spawning peak times.

And hopefully everyone will keep on taggin'.



## HONORED FISH

In ancient times, ulua held a very high place in Native Hawaiian culture. The powerful jack fish was fished for sport only by alii, who were the chiefs in Hawaii. Rick Gaffney states in his 2000 study for the state that the fish was even used when a human sacrifice was not available. Evidence of the respect for the fish is found in a Hawaiian proverb, "*Ka ulua kapapa o ke kai loa*," which Gaffney translates as the ulua is strong like a warrior.

The ulua is also featured in Native Hawaiian stories. Tom Cummings, cultural educator at Bishop Museum, relates the story of Pimoe. Pimoe is a giant Ulua who Maui catches, but as he hauls Pimoe in the fish breaks into pieces. Pieces of Pimoe's flesh then transformed into the eight major Hawaiian Islands.



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